No. 610,877. Patented Sept. 13, 1898.

M. F. McNELLY.

ACETYLENE GAS GENERATOR.

(Application filed Oct. 30, 1897.)

(No Model.) 2 Sheets—Sheet 1.

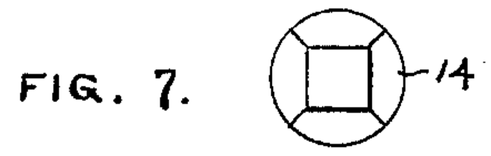

FIG. 7.

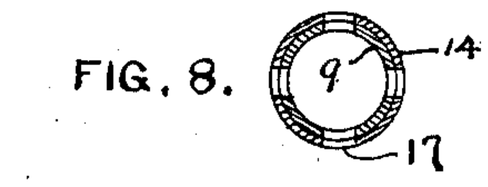

FIG. 8.

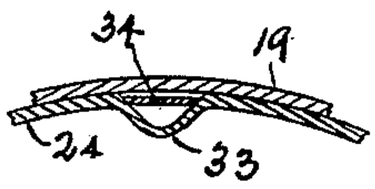

FIG. 6.

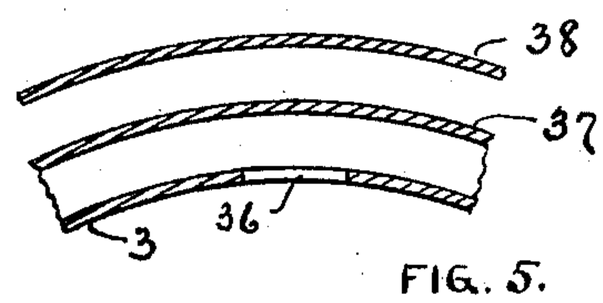

FIG. 5.

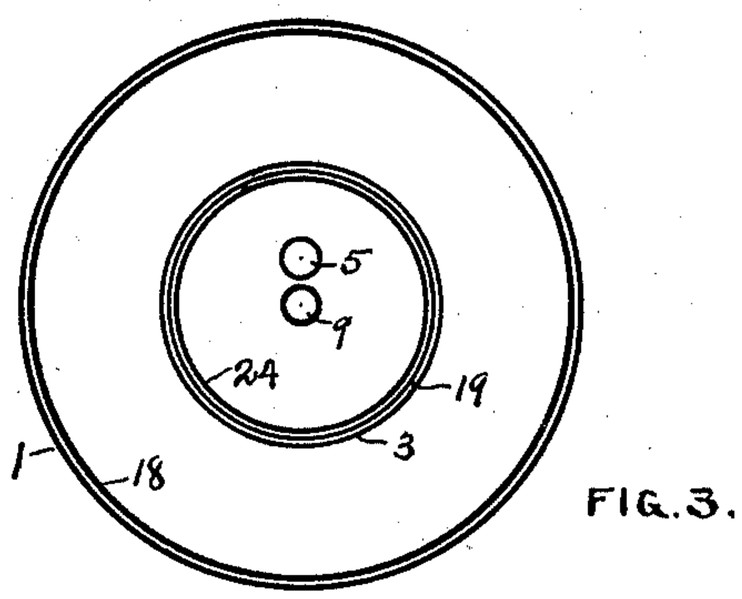

FIG. 3.

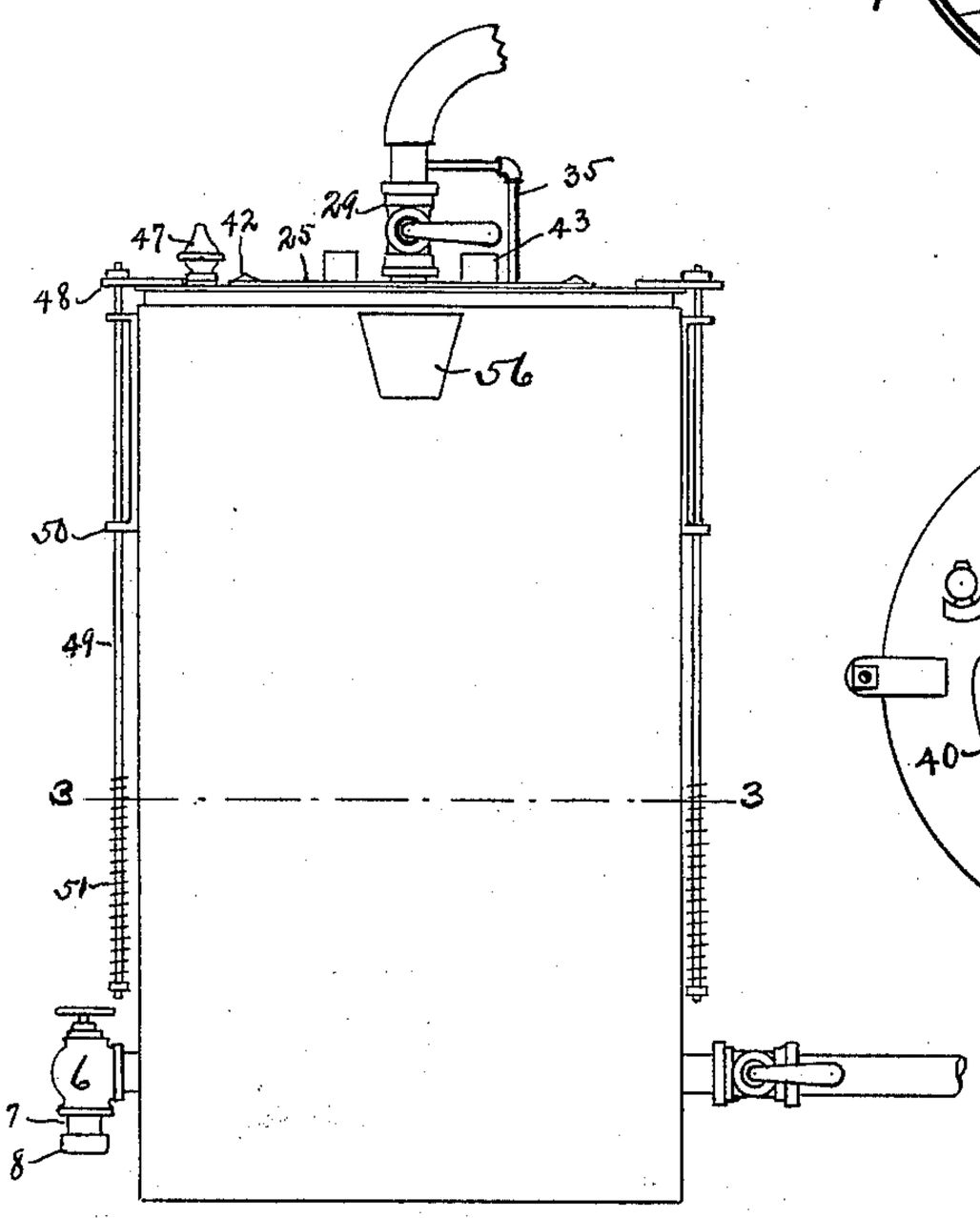

FIG. 1.

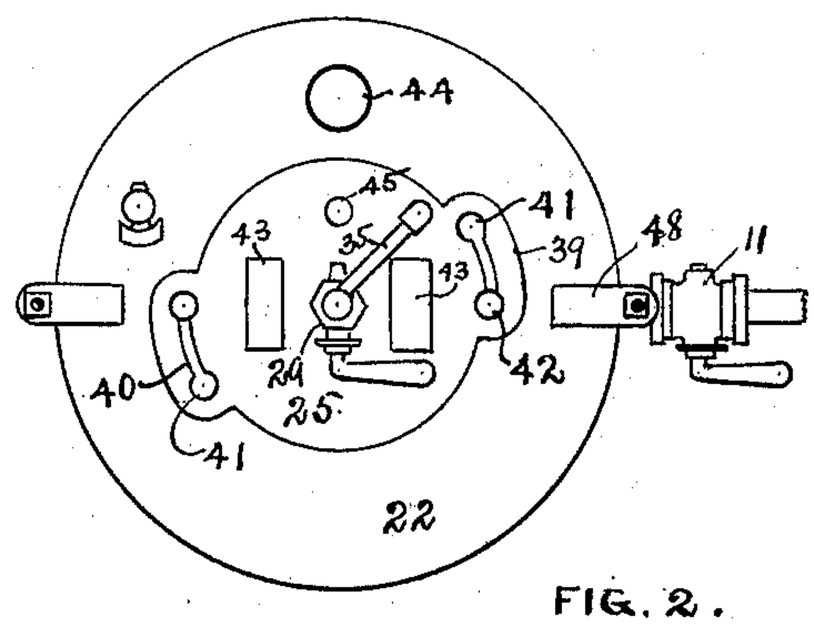

FIG. 2.

WITNESSES:
W. T. Angell
P. A. Mahony

INVENTOR:
Mathias F. McNelly
By Casper L. Redfield
ATTORNEY.

No. 610,877. Patented Sept. 13, 1898.

M. F. McNELLY.

ACETYLENE GAS GENERATOR.

(Application filed Oct. 30, 1897.)

(No Model.) 2 Sheets—Sheet 2.

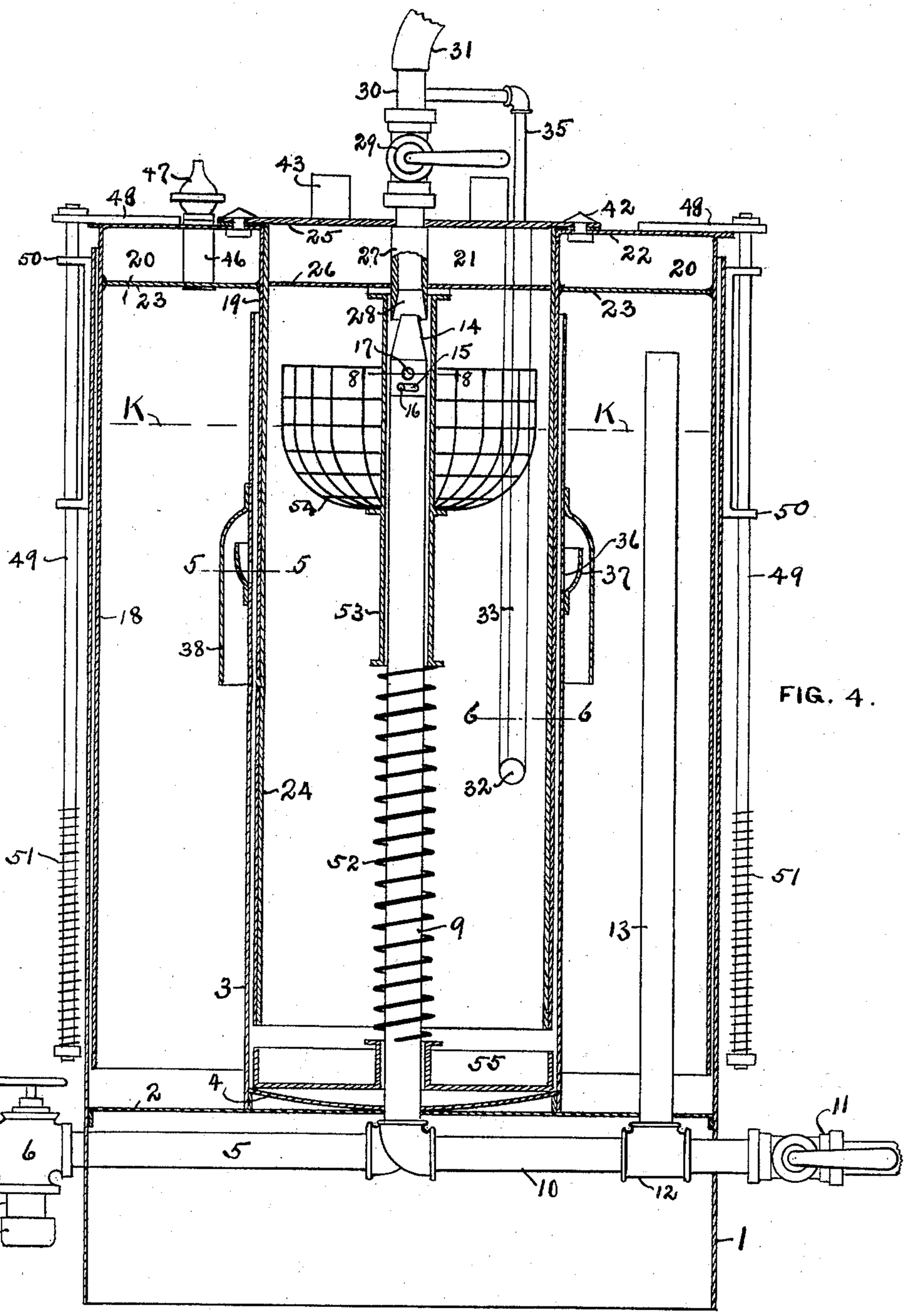

FIG. 4.

WITNESSES:
W. T. Angell
B. A. Mahoney

INVENTOR:
Mathias F. McNelly
BY Casper L. Redfield
ATTORNEY.

UNITED STATES PATENT OFFICE.

MATHIAS F. McNELLY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE MONARCH MANUFACTURING COMPANY, OF INDIANAPOLIS, INDIANA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 610,877, dated September 13, 1898.

Application filed October 30, 1897. Serial No. 656,876. (No model.)

To all whom it may concern:

Be it known that I, MATHIAS F. MCNELLY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification.

My invention relates to generators in which gas is generated by chemical action between calcium carbid and water, and has for its object certain improvements for convenience in handling and security against the escape of gas when recharging or removing sediment.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a plan. Fig. 3 is a transverse section on line 3 3 of Fig. 1. Fig. 4 is an enlarged vertical section, the view being similar to Fig. 1. Fig. 5 is an enlarged partial transverse section on line 5 5 of Fig. 4. Fig. 6 is a similar section on line 6 6. Fig. 7 is a plan of the valve-cap on the center pipe, and Fig. 8 is a section of the same on line 8 8 of Fig. 4.

In the said drawings, 1 is an exterior cylindrical shell provided with a bottom 2, to which is secured an interior shell 3, having a concave bottom 4. From the lowest point of this bottom and a little to one side of the center is a waste-pipe 5, provided with a shut-off valve 6. Beyond the valve 6 are a nipple 7 and a cap 8. Located at the center of shells 1 and 3 is an upright pipe 9, that passes through the bottoms 2 and 4 and connects to a horizontal pipe 10 by means of an elbow. The pipe 10 passes through the shell 1 and is provided with a valve 11. Between the valve 11 and the elbow on pipe 10 is a T 12, from which a pipe 13 rises through the bottom 2 into the annular space between shells 1 and 3. There is free communication between pipes 9 and 13, the upper ends of which are near the tops of the shells 1 and 3. The end of pipe 9 is closed by a cap 14, which terminates in a tapered square, as shown in Figs. 4 and 7. The cap 14 has a slot 15, which embraces a pin 16 in the pipe 9, and passing through the shells of both pipe and cap are holes 17. The slot 15 permits the cap 14 to be turned sufficiently to open or close the holes 17, and consequently the communication between the interior pipe 9 and the chamber in which it is located.

Similar to and slightly smaller in diameter than the shells 1 and 3 are a pair of connected and inverted shells 18 and 19, that are provided with an inclosed annular water-space 20 by means of the heads 22 and 23. The shells 18 and 19 are set into the shells 1 and 3 in the manner shown in Fig. 4. The heads 22 and 23 do not extend across the inner shell 19, but leave a cylindrical opening, into which is inserted another cylindrical shell 24, which has a water-space 21, inclosed by heads 25 and 26. Passing through the heads 25 and 26 is a pipe 27, the lower end of which terminates in a socket 28, adapted to fit the square top of cap 14. On the top of pipe 27 is a valve 29, from which extend a nipple 30 and a hose 31. In the lower part of the shell 24 is an opening 32, above which the shell is bent inward, as shown at 33. (See Fig. 6.) Over the crease thus formed is soldered a plate 34, thus leaving a conduit from hole 32 to the head 25. From this point a small pipe 35 connects to the nipple 30 above the valve 29. Located a little above the center are a series of holes 36 in the shell 3, and secured to said shell, at the lower edge of said holes, is a cup-shaped ring 37, that rises above the top of the holes. Secured to the same shell, above the ring 37, is another and inverted cup-shaped ring 38, that embraces the ring 37 and extends below it. The head 25 is provided with wings 39, that have slots 40, enlarged at 41 to permit the head of bolts 42 to pass through. These wings, slots, and bolts are arranged so as to lock the head of shell 24 to head 22 in a manner that will be readily understood by Fig. 2. The slots 40 and the socket 28 are so placed in regard to each other that when the head 25 is turned so as to permit shell 24 to be withdrawn the cap 14 will be turned so as to close the openings 17, and when the head is turned in the opposite direction to lock it the cap 14 is turned so as to open said holes 17. Handles 43 on the head 25 facilitate this turning and the withdrawal of shell 24. Openings 44 and 45, provided with sheet-metal caps like those used on oil-cans, serve as a means of filling the spaces 20 and 21 with water. A pipe 46, passing through heads 22 and 23 and provided with a cock 47, serves as a means of venting the space inclosed by shells 18 and

19. On the top of head 22 are brackets 48, through the overhanging portion of which bolts 49 extend down the side of shell 1. Guides 50 on shell 1 keep these bolts in line and prevent the shell 18 from turning. Springs 51 on the lower part of bolts 49 are adapted to come into contact with guides 50 when the shell 18 is raised to a certain height. This height is just before the hole 32 reaches the water-line K. Supported by a spring 52 is a sleeve 53, that surrounds the pipe 9 and carries a wire basket 54 for holding the calcium carbid from which the gas is generated. In the bottom of shell 3 is a removable pan 55 for catching the greater quantity of the sediment deposited from the carbid, the remainder being washed out through pipe 5. A spout 56 on the outside of shell 1 serves as a means of filling the interior with water.

In using the generator the basket 54 is filled with broken lumps of calcium carbid and the shell is filled with water to the line K. Water poured into the outer annular space seeks its level in the inner space through the openings 36 in the shell 3. The spring 52 has such strength that it will raise the basket and its contents above the water-line when it does not bear any other load; but when the shell 24 is inserted and locked to the head 22 the head 26 comes into contact with the top of the sleeve 53 and depresses the spring 52, so as to immerse the carbid. As gas is generated it passes through the space between the top of the sleeve 53 and bottom face of the head 26, which spaces are formed by projections on the top of said sleeve. Thence it passes inside the sleeve 53 through holes 17 and pipes 9, 10, and 13 to the annular space between shells 1 and 3. It also passes through pipe 10 and valve 11 to the gasometer. The pressure thus formed on the under face of the heads 23 and 26 tends to lift the inverted shells 18, 19, and 24, which lifting action is resisted in a measure by the weight of water in the spaces 20 and 21. The water in these spaces also serves another purpose in keeping the top heads 22 and 25 cool, so that they are not objectionable to handle. As the formation of the gas is intermittent and generates considerable heat, there would be times when the top of the generator would be quite hot if it were not for some body that would absorb or insulate the heat. When the gas being generated is not being continually used, the accumulation increases the pressure in the generator till it raises the inverted shell high enough to cause the head 26 to clear the sleeve 53, when the spring 52 raises the basket and its contents clear of the water and stops the generation of more gas. In case there should be a rapid generation of gas (when the valve 11 is closed) that would raise the inverted shells too high the springs 51 would first come into contact with the guides 50 to increase the load, and in case the quantity generated was still too great and caused a further rise till the hole 32 passed above the water-line K then gas would be permitted to escape through said hole 32, groove 33, and nipple 30 to hose 31, which has its discharge end carried to some point outside of the building. The gas thus vented will permit the inverted shells to again descend, and as soon as the surplus pressure is relieved the hole 32 will pass below the water-line and prevent further waste. The object of having a hose 31 on the nipple 30 is to make a flexible waste connection that will not interfere with the free lifting out of the shell 24. When the generation of gas ceases by reason of the carbid being used up, the upper part of the generator settles down to the lowest point, and there is only a small amount of gas left above the surface of the water. The recharging is as follows: The valve 11 is closed, thus preventing the return of gas from the gasometer. The inner casing is then turned so that the circular openings 41 come under the bolt-heads 42. This not only leaves the shell 24 free to be withdrawn, but it closes the openings 17, thus preventing the escape of gas from the annular space through the pipes 13, 10, and 9. There is then only the small amount of gas over the basket 54 that needs to be considered. The valve 29 is then opened, and any surplus pressure existing causes part of it to escape through the waste-hose 31, which escape is facilitated by the pressure in the annular space forcing the water above its level in the center space. The shell 24 is then lifted out, the vacuum caused thereby being filled by air entering through the hose 31. As the shell 24 may be, when removed, set with its open end on the floor, it will be evident that all the gas remaining will either be inclosed within the shell 24 or permitted to escape through hose 31, and consequently none, or very little, can possibly escape into the room where the generator is located. The basket 54 may then be refilled with carbid and the shell 24 returned to position, or the pan 55 may first be lifted out and emptied. When the shell 24 is returned to position and locked in the manner described, the ports 17 are opened by that action, and the gas generated is free to flow to the gasometer. When it is desired to wash out the sediment, the cap 8 is removed and the valve 6 is opened. This draws all of the water out of the central compartment irrespective of whether the shell 24 is in or out of place. When the shell 24 is in place, air flows in through pipe 35, groove 33, and hole 32. Drawing the water out of the central compartment also draws it out of the annular one down to the level of the upper edge of the ring 37, the ring 38 keeping the gas sealed against escape through the holes 36.

What I claim is—

1. A generating-chamber, a cover therefor, an interior valve and connecting-pipe for discharging gas therefrom, a waste-pipe passing through said cover and provided with a socket adapted to engage said valve, a second valve closing said waste-pipe, means for securing

and releasing said cover by a rotary movement of itself, and means whereby said rotary movement will also operate to open and close said interior valve.

2. A generating-chamber consisting of a shell constructed to contain water and an inverted shell or bell telescoping therein, water within said chamber, a central discharge-pipe passing through the bottom of said chamber and extending to the space above said water, a carbid-holding basket surrounding said pipe and vertically guided thereby, a spring for supporting said basket above the water, and means whereby said inverted shell will, in descending, depress said spring so as to cause said basket to enter the water.

3. A generating-chamber consisting of a shell constructed to contain water and an inverted shell telescoping therein, water within said chamber, a central discharge-pipe passing through the bottom of said chamber and extending to the space above the water, a sleeve surrounding said pipe and vertically movable thereon, an annular basket secured to said sleeve, and a spring surrounding said pipe and adapted to elevate said basket above the surface of the water.

4. A generating-chamber consisting of a shell constructed to contain water and an inverted shell telescoping therein, water within said chamber, a central pipe extending from the bottom of said chamber to the upper part thereof, a sleeve surrounding said pipe and vertically movable thereon, a basket secured to said sleeve, means for elevating said sleeve so as to support said basket above the surface of the water, and means whereby the telescoping shell in descending will depress said sleeve so as to cause said basket to enter said water.

5. A generating-chamber consisting of a shell constructed to contain water and an inverted shell telescoping therein, similarly-constructed annular shells surrounding the first-mentioned shells, water within both spaces thus inclosed, a central pipe extending from the upper part of the generating-chamber to and through the bottom thereof and having connections for the discharge of gas into the annular space, an annular basket surrounding said pipe and vertically guided thereby, and means for intermittently immersing said basket in the water of the central chamber.

6. Stationary concentric shells furnishing central and annular spaces with closed bottoms, water within said shells, similar inverted shells telescoping into the former and vertically movable, a central pipe in the stationary part and provided with connections for the discharge of gas from the upper part of central space to the upper part of the annular space, a sleeve surrounding said central pipe and vertically movable thereon, a basket secured to said sleeve, a spring for supporting said basket above the surface of the water in the central space, and means whereby the inverted shells in descending will depress said spring and cause said basket to become immersed in said water.

7. A generating-chamber constructed to contain water therein, a removable cover for said chamber provided with a sealing-flange adapted to be inserted in the water, means whereby said cover will rise and fall by the generation and discharge of gas, a central pipe passing through the bottom of said chamber and adapted to discharge gas therefrom, a carbid-holding basket surrounding said pipe and vertically movable thereon, a spring surrounding said pipe and adapted to elevate said basket above the surface of the water, and means whereby said cover will depress said basket to immerse it in said water.

8. An interior and an exterior shell furnishing a central and an annular space each with a closed bottom, an inverted shell telescoping into the first-mentioned shell and having a central opening therethrough, an upright pipe in the central space extending through the bottom and connected to a discharge-pipe, a valve on the top of the upright pipe, a cylinder inserted in the opening through the inverted shell, a head for said cylinder having a socket for engaging said valve, means for locking said cylinder to the inverted shell, and means whereby the movement required to lock and unlock said cylinder will open and close said valve.

9. Stationary concentric shells furnishing central and annular spaces with closed bottoms, water therein, similar inverted shells telescoping into the former and vertically movable, hollow heads on the inverted shells adapted to contain water, a central standard in the stationary part, a vertically-movable basket surrounding said standard and guided thereby, a spring for supporting said basket above the surface of the water, and means whereby said inverted shells serve to depress said basket so as to immerse in the water.

10. Stationary concentric shells secured to a plate serving as a bottom for both, water therein, similar inverted and movable shells telescoping with the stationary ones, a pair of plates connecting the movable shells and serving as a hollow head for the annular space between them, a removable head for central part of the inverted shells, a flange on the removable head immersed in the water located in the central space thereby inclosing a space serving as a generating-chamber, a carbid-holding basket supported in the generating-chamber, means for intermittently immersing said basket in the water of the central chamber, and means for conveying the generated gas from the central to the annular chamber.

MATHIAS F. McNELLY.

Witnesses:
G. M. BRILL,
W. T. ANGELL.